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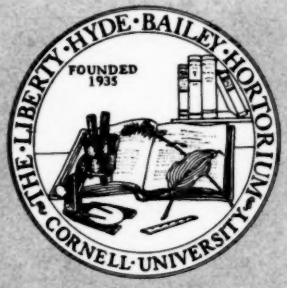

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Campanula punctata

William J. Dress

Campanula punctata Lamarck has been known to botanists and been in cultivation for at least two hundred years, and, though it is not one of the more popular species, it is still available from several American seedsmen. The leaves of the basal rosettes (which have almost always withered and disappeared by flowering time) are long-petioled, with broadly to narrowly ovate blades, cordate bases, and irregularly and bluntly double-toothed and ciliate-hairy margins. The cauline leaves are relatively few, generally broadly lanceolate in outline, the lower ones broadly winged-petioled, the uppermost sessile, margined like the basal leaves but much more acuminate. The stems, rough-hairy in the lower half, usually reach about 2 feet (6 dm.) in height, or occasionally more, and branch above to form a relatively narrow panicle. The branches vary from one to 8 or 9 in number, are stiff, short, and ascending and bear terminally one to three reduced leaves and one to three flower-buds which develop in slow succession so that usually only one flower is open at a time on each branch. The pendent flowers are 5 to 7 cm. long; the interior of the corolla is bearded throughout with long, soft, white hairs and is peppered with small to minute purple dots which show through faintly on the white or more or less purple-flushed exterior. The five broad corolla-lobes spread outward only very slightly, if at all. The numerous seeds are released from the capsule by means of three pores near its base.

Campanula punctata is native to eastern Siberia, Korea, northeastern China, and Japan. It is a hardy perennial and spreads, like a number of other campanulas, by subterranean rhizomes, so that one may soon have a fine quantity of it, or even too much of it in some situations. The flowering period in Ithaca is late June and early July.

In 1844 the Royal Horticultural Society introduced into cultivation in England a campanula collected in gardens of eastern China by Robert Fortune; subsequently, in 1846, this was given the name C. nobilis by Lindley.

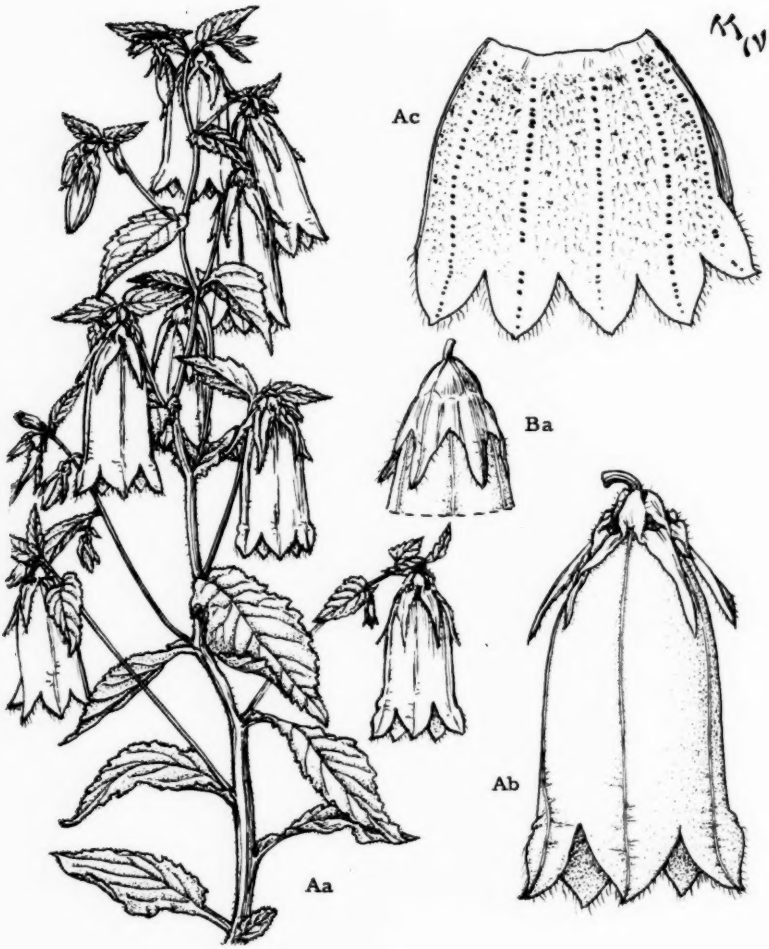

Fig. 30. Campanula punctata. A, subspecies punctata: a, upper part of stem x 2/5; b, flower, showing appendages in sinuses of calyx x 1; c, corolla expanded x 4/5. B, subspecies hondoensis: a, base of flower, showing calyx lacking appendages x 1.

Though its relationship to C. punctata was recognized at the time, it was nevertheless considered specifically distinct. Today, however, C. nobilis is considered a synonym of C. punctata, and the name C. nobilis rarely appears in seed lists anymore, though seed was offered under this name in the 1940's and earlier. A handsome portrait of the purple-flowered form cultivated as C. nobilis is to be found in Edwards's Botanical Register of 1846, plate 65.

Of recent years the name C. hondoensis has appeared in the seed lists of a few European botanic gardens, and has also been listed in the seed exchange of the Alpine Garden Society of England. Since there are many American members of this society, it is likely that plants are now being grown under this name in this country, also.

Campanula hondoensis was described as a new species by Siro Kitamura in 1936, in Acta Phytotaxonomica et Geobotanica (Kyoto) 5: 212, 213. It was said to differ from C. punctata in lacking the flap-like appendages in the sinuses of the calyx which are evident in that species (see fig. 30Ab and Ba). This one characteristic, however, seems to be the only distinguishing feature, for Kitamura's long and detailed Latin description of C. hondoensis otherwise fits C. punctata just as well. In Volume 17, p. 7, 1957 of the same journal, in fact, Kitamura and his co-worker Gen Murata reduced this taxon to a subspecies of C. punctata, and this does seem to be a better treatment of it.

Campanula punctata subsp. hondoensis is endemic to Honshu - in earlier years called Hondo - the largest of the islands of the Japanese archipelago, whence the specific epithet. Reference to herbarium material in the Bailey Hortorium's collections, and to Map 66 in Hiroshi Hara's Distribution Maps of Flowering Plants in Japan 1 (1958) shows, however, that the typical form (with calyx appendages) shares the same area with the form lacking the appendages, so that not all material from Honshu is the subspecies hondoensis (Kitamura) Kitamura & Murata.

Several attractive hybrids involving this species and, putatively, C. latifolia and C. Medium (Canterbury bells) have been recorded. No doubt there are possibilities in this direction which have yet to be explored. Seeds of typical C. punctata and the subspecies hondoensis, in mixture, collected from plants grown in the Bailey Hortorium garden, may be had upon request. Flowers of the parent plants varied from ivory-white to light purple. There is no apparent difference in garden value between the two taxa.

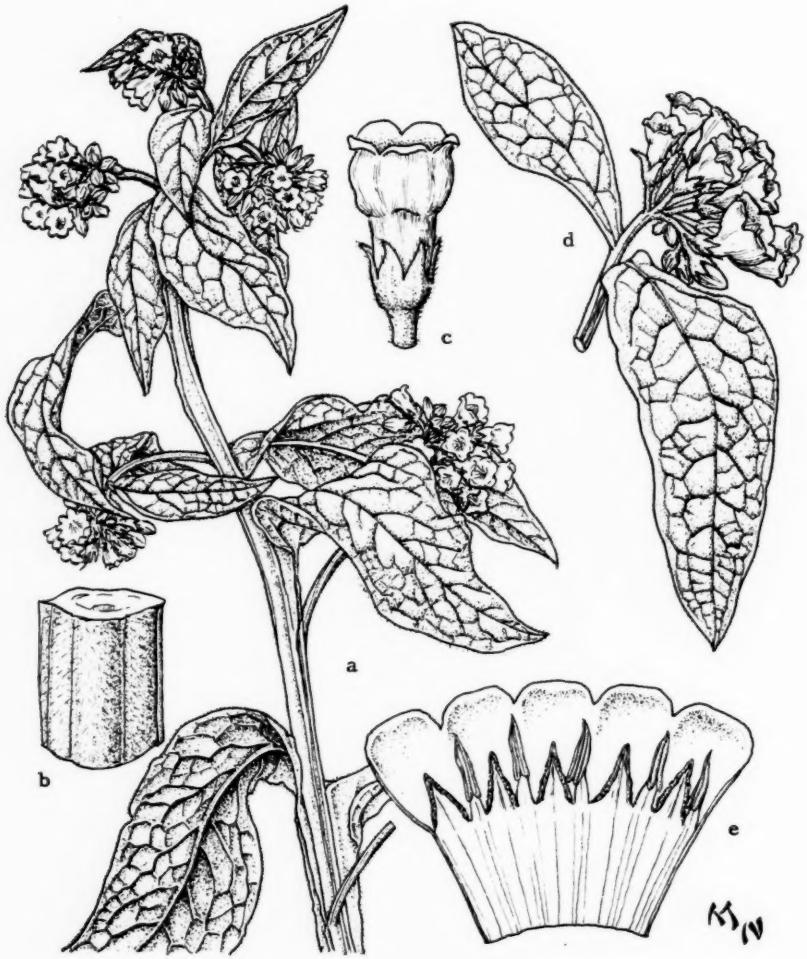

Fig. 31. Symphytum officinale: a, upper part of a stem x 1/2; b, section of stem, showing wings produced by decurrent leaf-bases x 2; c, inflorescence x 1; d, flower x 2; e, corolla expanded x 3.

Studies in the Cultivated Boraginaceae
5. Symphytum

John Ingram

Although all members of the genus Symphytum are native to either or both of the continents of Asia or Europe, a few of them have become naturalized in North America where they have spread from cultivation. The species are well adapted for spreading, owing to their roots which are often thick and fleshy, or even tuberous in some species. Because of these persisting roots, such species as S. × uplandicum and S. asperum are often difficult to eradicate once they have become established, since even the smallest fragment left in the soil may give rise to a new clump.

The name Symphytum has its origin in ancient Greek, meaning "grown together." It was obvious to the ancients, who were influenced by the doctrine of signatures, that the plant now known as S. officinale was endowed with healing virtues, especially for broken bones, a matter which could be ascertained very easily by observing the decurrent leaf-base (fig. 31), which forms a wing from the base of one leaf to the node of the next. As a matter of fact, Maud Grieve, in her Modern Herbal (pp. 215-218), gives an interesting and informative historical account of the role of S. officinale in medicine.

There are approximately 25 species of Symphytum known to science, but only two have achieved much success as ornamentals in the United States. The others recorded in cultivation have, at best, made only sporadic appearances. The plants of the taller species are inclined to be coarse; S. asperum, however, does have attractive blue flowers though the inflorescence is few-flowered. Even so, for the best effect, it is best planted in an odd corner of a fairly large garden. The shorter species, such as S. grandiflorum and S. caucasicum, are readily adaptable to rock-gardens.

Symphytums or comfreys, as they are commonly known, are rapid growers. Symphytum × uplandicum, the Russian comfrey, is reported to have an average protein content of 24 per cent of dry matter and has been used off and on as a fodder plant in Great Britain. It is reported as an ideal food for poultry and swine. In addition to its growing rapidly and its high protein percentage, it is of very easy culture, and will grow on rather poor soil which might

Fig. 32. Symphytum × uplandicum: a, upper part of a stem x 4/5; b, flower x 3; c, corolla expanded x 2.

not support another crop. Those interested in this matter are referred to the book, Russian Comfrey by Lawrence D. Hills, published by Faber and Faber Limited, London.

Linnaeus (Species Plantarum, ed. 1, 1: 136. 1753) adopted the name Symphytum used earlier by Tournefort. He accounts for three species. Various treatments, naturally, followed after Linnaeus's original effort. The most significant monograph of Symphytum, and the standard reference work for the genus, is now almost fifty years old (Cedric Bucknall, "A revision of the genus Symphytum," Journal of the Linnean Society, Botany, 41: 491-556. 1913).

Comfreys are typical temperate zone borages, from their herbaceous perennial habit, one-sided coiled inflorescence, 5-lobed gamopetalous corollas, 5 epipetalous stamens, to their fruits which are nutlets. The inflorescence is terminal and frequently geminate. At least in some of the species, the flowers are reminiscent of the genus Mertensia, except that in Symphytum the corolla bears 5 long tapering scales in its throat. The following key is offered for those species known in American horticulture in recent years.

Key to the Cultivated Species of Symphytum

1. Stems essentially unbranched; roots tuberous; sterile shoots decumbent (fig. 33). . . . . S. grandiflorum

1. Stems much-branched; roots thick or spindle-shaped or with spindle-shaped divisions.

   2. Calyx not lobed below the middle (fig. 34Aa & Ba).

      3. Corollas white. . . . . S. orientale

      3. Corollas blue. . . . . S. caucasicum

   2. Calyx lobed below the middle and usually almost to the base (fig. 32b).

      4. Corollas white, cream-colored, or yellow.

         5. Cauline leaves not decurrent, ovate to oblong-ovate, cordate to rounded at the base. . . . . S. tauricum

         5. Cauline leaves strongly decurrent, often forming a wing down the stem to the next lower node, oblong-lanceolate to oblong-ovate (fig. 31). . . . . S. officinale

      4. Corollas rose, purple, or rose-pink changing to blue or purple.

         6. Cauline leaves strongly decurrent, forming a wing down the stem; flowers dull purple or rose; calyx not enlarging in fruit; anthers shorter than the filaments. . . . . S. officinale

         6. Cauline leaves not or only very shortly decurrent on the stem; calyx mostly enlarging in fruit; anthers longer than the filaments or almost equal to them in length.

            7. Expanded flowers purple; calyx-lobes linear-lanceolate, acuminate; anthers and filaments about equal in length (fig. 32). . . . . S. × uplandicum

            7. Expanded flowers blue; calyx-lobes triangular, obtuse; anthers longer than their filaments (fig. 35). . . . S. asperum

Symphytum grandiflorum de Candolle (Prodromus 10: 40. 1846). This species is not offered in the American trade under its correct name, but it appears to be the plant offered occasionally as Pulmonaria lutea. It is easily identified by its unbranched decumbent stems and yellow flowers with their corollas 2 to 3 times as long as their calyces. It grows well in shaded areas, ultimately making a large patch as the stems become prostrate on the ground and eventually root. A related species, not known to be in cultivation in the United States, is S. cordatum, a taxon which is similar to S. grandiflorum but differs in its sterile shoots' being erect and in its flowers with their calyces at least half as long as their corollas. Symphytum grandiflorum is a native of the Caucasus.

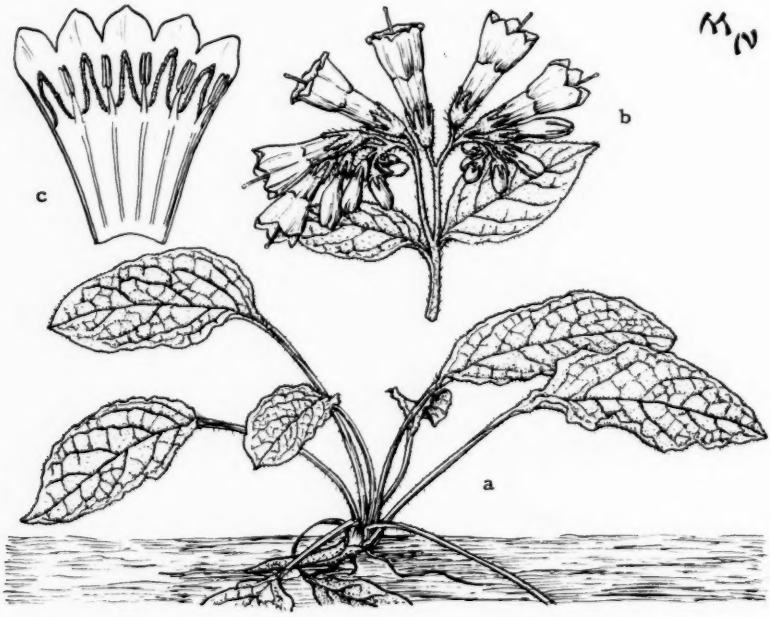

Fig. 33. Symphytum grandiflorum: a, habit x 2/5; b, inflorescence x 1; c, corolla expanded x 2.

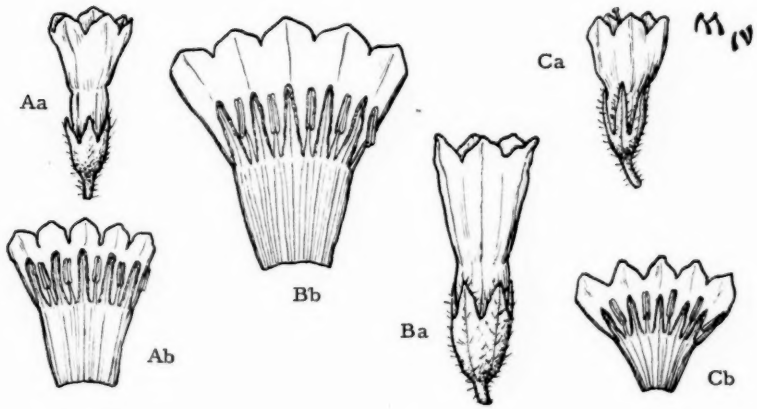

Fig. 34. A, Symphytum caucasicum: a, flower; b, corolla expanded. B, Symphytum orientale: a, flower; b, corolla expanded. C, Symphytum tauricum: a, flower; b, corolla expanded. (All x 2)

Symphytum orientale Linnaeus (Species Plantarum, ed. 1, 1: 136. 1753, pro parte). Linnaeus's concept of this species included what modern taxonomists regard as at least two species. As it is known today, it is a branched herbaceous perennial with white flowers, and, like the following species, differs from other cultivated species in having flowers with their calyces not lobed below the middle. This characteristic is best observed in younger flowers, as the fruiting calyx in some of the species is inclined to enlarge and appear quite different from when it was younger. This species comes from the area around Istanbul.

Symphytum caucasicum Bieberstein (Flora Taurico-Caucasica exhibens stirpes phaenogamas ... 3: 128. 1808). This is a softly hairy, branched species growing to about 6 dm. high. Though the opened flowers are a clear blue, the buds are red-purple, a situation occurring in any number of the Boraginaceae. The calyx is about half as long as the corolla, and only shallowly lobed. This is said to be an attractive rock-garden plant. As its name implies, it grows as a native in the Caucasus.

Symphytum tauricum Willdenow (Neue Schriften der Gesellschaft Naturforschender Freunde zu Berlin 2: 120, t. 6. 1799). In its habit and leaves with cordate bases, S. tauricum shows a strong resem-

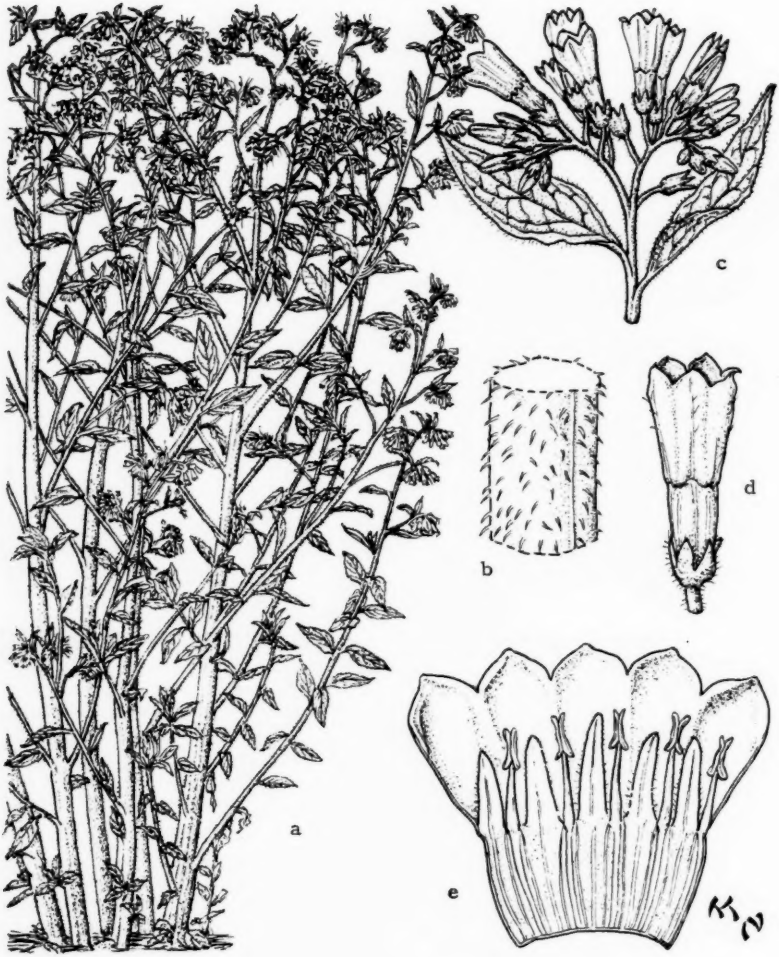

Fig. 35. Symphytum asperum: a, habit x 1/10; b, section of stem x 2; c, inflorescence x 1; d, flower x 2; e, corolla expanded x 3.

blance to S. orientale. Even though their flowers are similar in color, S. tauricum has flowers with their calyces divided below the middle, and leaves with undulate margins and wrinkled on the upper surface. It is a native of south-central Europe and southern Russia.

Symphytum officinale Linnaeus (Species Plantarum, ed. 1, 1: 136. 1753). Common comfrey, healing-herb. One of the most distinctive and wide-spread members of the genus, it is easily recognized by its decurrent leaf-bases which form wings on the stem. This species shows a wide range of flower color - some are white or cream-colored, others are dull purple or even rose. Symphytum officinale has one of the greatest natural ranges of all the species in the genus, growing in most of Europe to western Siberia and central Asia. It is also found as an adventive species in North America, growing in its usual habitat along wet ditches, stream banks, and in waste places. Also in cultivation is cultivar 'Variegatum', with white-margined leaves.

Symphytum × uplandicum Nyman (Sylloge Florae Europaeae, 80. 1854-55). [S. peregrinum Ledebour, Index Seminum Hort. Dorpat, 4. 1820.] Russian comfrey. Because Symphytum × uplandicum is a hybrid, it shows certain characteristics of both its parents, S. officinale and S. asperum. However, it is much more likely to be confused with S. asperum than with S. officinale. It is a rather coarse, hispid, herbaceous perennial, rapidly growing to about 2 meters tall. Its flowers are purple, developing from rose-colored buds. It thus differs from its blue-flowered parent, S. asperum, in flower color, as well as in its acuminate calyx-lobes and in its stamens which have filaments and anthers about equal in length. Two papers dealing with the S. × uplandicum problem in Britain are cited here for those who are particularly interested: T. G. Tutin, "The genus Symphytum in Britain," Watsonia 3: 280-281. 1956; A. E. Wade, "The history of Symphytum asperum Lepech. and S. uplandicum in Britain," Watsonia 4: 117-118, 1958. This taxon seems to have been originally from the eastern Caucasus, but it now has become naturalized in much of Europe.

Symphytum asperum Lepechin (Nova Acta Académie Impériale des Sciences St. Petersburg 14: 442, t. 7. 1805). [S. asperrimum Donn ex Sims in Curtis's Botanical Magazine 24: t. 929. 1806.] Prickly comfrey. The gardens of the past were more likely to have contained prickly comfrey than the modern garden. It is a coarse plant with its stems bearing recurved almost prickly hairs. Being much like the preceding taxon, S. asperum often has been confused with it. However, S. asperum can be distinguished by its blue flowers, blunt calyx-lobes, and stamens with their filaments much longer than their anthers. Its native home is in the area from the Caucasus to Iran; it has also escaped from cultivation and established itself in suitable habitats in North America.

Note on the Nomenclature of Piper magnificum

O. Schwarz[1]

When T. G. Yuncker, in Baileya 7: 129, 1959, gave a new name to the fine Piper which is, though rarely, cultivated in botanical gardens under the name P. magnificum (Linden) Gentil, he was mistaken. As he reported, this species has received the following names up to the present:

Artanthe magnifica Linden (1876) non Miquel (1844).
Artanthe decurrens Fournier (1876), non Miquel (1844); non Piper decurrens de Candolle (1866).
Piper magnificum Hort. ex Gentil (1907), nomen nudum; ex Trelease in Macbride (1936), nomen rite publicatum.
Piper bicolor Yuncker (1959).

Linden's and Fournier's binomials are both illegitimate as later homonyms. Trelease, when working on the genus Piper for Macbride's Flora of Peru, did not find any valid epithet in the genus Piper for the species concerned. Therefore, he was authorised to take any epithet he liked, provided it was not yet preoccupied in the genus like the epithet "decurrens." Linden's epithet magnifica, illegitimate only in the genus Artanthe but not in the genus Piper, because nomina nuda have no stutus at all in nomenclatural questions, was not yet used in Piper; hence, Trelease was entirely correct in making it legitimate in this genus by creating the new combination or rather, in the strict sense of the Nomenclatural Rules, the new name, P. magnificum Trelease. But it is not impossible that the same name supported by a description will be found in the literature of horticulture prior to Trelease. Yuncker's name, in any case, must be considered a superfluous synonym.

[1]Friedrich-Schiller-Universität, Jena, GDR.

Photinia × Fraseri, a New Hybrid

William J. Dress

Photinia is a genus of Asiatic shrubs and small trees belonging to the Rosaceae, the rose family. Of the 40 or so species known, few are in cultivation and only three are at all common in this country, though those three are widely planted. Photinia villosa (Thunberg) de Candolle is deciduous and hardy throughout most of the United States, an unprepossessing large shrub used for its height (to 5 m.) and its autumnal red foliage and clusters of bright red berry-like fruits. Photinia serrulata Lindley and P. glabra (Thunberg) Maximowicz are evergreen and less hardy, grown commonly on the West Coast and throughout the South as far north as Virginia for their glossy leathery foliage and corymbs of small white flowers and, later, red fruits. Of the two, P. serrulata is the handsomer and more popular.

Of recent years, a hybrid between Photinia serrulata and P. glabra has been offered in the trade, has been rather widely distributed, and has been admired by knowledgeable plantsmen as a promising new ornamental. Originating in the Fraser Nurseries of Birmingham, Alabama, it has been distributed as Photinia Fraseri, though the name has not previously been adequately published. In response to an inquiry about its origin and early history, Mr. O. W. Fraser, President of Fraser Nurseries, Inc., has written, in correspondence:

"This is definitely a seedling, from seed gathered from Photinia serrulata which grew in close proximity to Photinia glabra. We first noticed the plant in a group of seedlings planted about 1940. We grew it rather sparingly for the first two or three years, thinking that some of the outstanding characteristics might be lost as the plants aged, but after several years of rather meagre propagation, we liked it so well that we propagated more heavily. The first plants released to the trade were sold to Tom Dodd Nurseries on November 8, 1955, and here it attracted so much attention...that a considerable demand developed almost immediately.

"There can be no doubt as to the origin of the plant; it is a seedling of P. serrulata, but shows more of the characteristics of P. glabra than of P. serrulata. Strangely enough, in several hundred seedlings, there was only this one plant that showed characteristics different from either of the parents."

Because this hybrid Photinia has now been sold for a number of years and distributed rather widely, it has been suggested by Mr.

Brian Mulligan (Director of the University of Washington Arboretum, Seattle) and Professor Henry P. Orr (Associate Professor of Horticulture, Auburn University, Auburn, Alabama) that it should no longer be left without a formally and validly published name and description. Dr. Orr in April of this year provided a number of living cuttings, in flower and with new vegetative shoots, from a plant growing at Auburn. It is from these that the descriptions have been drawn, and the type and isotype specimens prepared.

Photinia × Fraseri, hybrida nova.

Hybrida, inter P. serrulatam Lindl. [♀] et P. glabram (Thunb.) Maxim. [♂] parentes omni ex parte media, foliorum laminis ellipticis vel elliptico-obovatis, 7-9 cm. longis, serrulatis, late cuneatis, abrupte et breviter acuminatis, recentibus clare ignicoloribus, maturis viridibus sed subtus pallidioribus, petiolis plerumque 1.2-2.3 cm. longis, in iuventute supra villosis, floribus corymboso-paniculatis, paniculis 10.5-12.5 cm. diam., petalis intus basi pubescentibus, fructibus non visis.

TYPE specimen in the herbarium of the L. H. Bailey Hortorium, Cornell University: Grown at Auburn [Alabama], and sent by Prof. H. P. Orr for formal naming. Received [in living condition] April 5, 1961. ISOTYPES distributed to the herbaria of: The Arnold Arboretum, Cambridge, Massachusetts; The California Academy of Sciences, San Francisco, California; The Royal Botanic Garden, Edinburgh, Scotland.

Since it is possible that slightly different but horticulturally significant cultivars may in the future be produced from repeated hybridization of Photinia serrulata and P. glabra, the form introduced by the Fraser Nurseries and described here may be known as cv. 'Birmingham'.

The following table will afford an easy means of comparing the hybrid with its parents, in respect to the important diagnostic characteristics:

	P. serrulata	P. × Fraseri	P. glabra
Leaf-blades	Oblong to oblong-oblanceolate 9-18 cm. long Usually rounded basally	Elliptic to elliptic-obovate 7-9 cm. long Broadly cuneate	Elliptic to narrowly elliptic-obovate 6-8 [-9] cm. long Cuneate
Petioles	2-4 cm. long Villous on upper surface when young	1.2-2.3 cm. long Villous on upper surface when young	1-1.5 cm. long Glabrous throughout even when young
Inflorescence	10-18 cm. in diam.	10.5-12.5 cm. in diam.	5-10 cm. in diam.
Petals	Glabrous	Pubescent inside at very base	Densely pubescent inside at base

The foliage of the new growth in Photinia × Fraseri cv. 'Birmingham' is a beautiful, vivid bronzy-red, while the older leaves of the previous year are thick and leathery, glossy dark green above and lighter green below. The flowers have the unpleasant odor which is characteristic also of most Crataegus flowers; the calyx-lobes are reddish, and the petals are touched with pale pink in the bud stage but open to white, and are villous at the base on the interior, though less densely and conspicuously so than in P. glabra. At the time of this writing, it is not known to me whether this hybrid produces fruit.

Added pertinent notes may be included here, taken from a letter (October, 1959) from Dr. Orr: "Our plant is developing beautifully as a compact, upright plant. It seems to become dense quicker than P. glabra and has less leaf spot in this climate than either of its parents. It is less coarse than P. serrulata and has much of the color value of P. glabra. Our plant has not fruited."

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Fig. 36. Chlorophytum capense. Plant under cultivation at Pretoria, collected originally near Port Elizabeth in the Alexandria district, Cape Province.

Chlorophytum capense and C. comosum

William J. Dress

The identity of the plants so generally grown and sold as Chlorophytum capense (or as C. elatum, a synonym) was questioned in an earlier article, "Chlorophytum (Liliaceae) in Cultivation" (Baileya 9: 29-50. March, 1961). As was pointed out at that time, the so-called Chlorophytum capense in cultivation tends to be proliferous in the manner of C. comosum (Thunberg) Jacques, though early descriptions and illustrations of the former species indicated no such character. Herbarium specimens at the L. H. Bailey Hortorium, collected over a period of several decades and from many sources, from plants cultivated as this species, had been examined but seemed to be indistinguishable from material grown as C. comosum. Chlorophytum capense, as described on page 204 of Bailey's Manual of Cultivated Plants (1949), has all the characteristics of C. comosum (Thunberg) Jacques; the "Chlorophytum elatum vittatum" illustrated in Graf's Exotica 2, page 697 (1959), is as proliferous as the "Chlorophytum comosum mandaianum" in the adjoining photograph.

However, though suspecting that the C. capense in cultivation in America was not different from C. comosum, I had available for comparison no authentic living or herbarium material of C. capense collected from the wild in its native country. There was also the possibility to consider that individual plants of C. capense might tend to be proliferous and that through selection the proliferous form had become the common one in cultivation. The question, then, was left unanswered in the previous article, with the hope expressed that some future monograph of the South African species would eventually settle it.

Happily, a letter from Mrs. A. A. Mauve, of the Division of Botany, Department of Agricultural Technical Services, Pretoria, has informed me that she has recently completed a revision of the South African species (of which there are 20) and that it is now in press. With her permission, I am quoting below part of her letter, which provides interesting and valuable information pertinent to the identification of our most commonly cultivated chlorophytum.

"Chlorophytum capense (L.) Voss is a rather rare species found near Port Elizabeth and Grahamstown. It has always intrigued me

how this species could have arrived in England and Holland at such an early date. It does not occur on the Cape Peninsula and this was before Thunberg, Sparmann, Masson and others ventured more to the east.

"C. comosum (Thunb.) Jacques is very common in the eastern Cape and Natal, where, because of its rapid reproduction, it can cover vast stretches as undergrowth of the forests. It also grows in the forests of the eastern Transvaal but there it does not proliferate as far as we know.

"Below I list the differences between these two species as observed on wild material:

C. comosum	C. capense
A shade- and moisture-loving plant	A plant of sandy downs, karroid scrub near the sea or rivers
Proliferous	Never proliferous
Leaves green, soft, tapered towards the base, loosely arranged, very variable in size (± 25 parallel veins)	Leaves firm, glaucous, forming an elongated rosette (± 25 parallel veins)
Raceme with 1-3 lax, long basal branches	Raceme much-branched, often with accessory branches in the axils
Scape terete	Scape compressed
Three to five ovules per cell	± Ten ovules per cell
Capsule wider than long	Capsule oblong

"Here in South Africa we cultivate only C. comosum (often called Hen and Chickens), the plain green form and the variety with a yellow band on each side of the midrib. Usually the cultivated plants are smaller or more neat than their wild brothers, probably as a result of selection.... The illustrations in Graf's Exotica 2... are all cultivated, variegated varieties of C. comosum, the "C. elatum vittatum" being the variety I have seen around here in florists' shops and in homes. Possibly the other two are also cultivated in South Africa but so far I have not yet noticed them. This variegated form is not found in the wild state."

The two photographs reproduced here were sent from the Division of Botany, Pretoria, by Mrs. Mauve and are used with permission. They represent a plant of Chlorophytum capense, originally collected in the wild near Port Elizabeth in the Alexandria district of Cape Province, and flowering at the Division of Botany in Pretoria early in 1961. The much-branched inflorescence characteristic of this species is well shown; the enlargement of part of the in-

Fig. 37. Chlorophytum capense. Close-up of part of inflorescence of plant in Fig. 36.

florescence shows an accessory branch in the axil of another, the flowers, and a few immature fruits.

It appears now safe to say that C. capense (Linnaeus) Voss is not cultivated in this country except possibly in botanical gardens, and even this is doubtful. Certainly, all the material in the Hortorium's herbarium taken from plants grown under this name or its synonyms has proved, upon re-examination, to represent forms of C. comosum, and descriptions and illustrations in the recent and current literature and catalogues, though purporting to pertain to C. capense, actually apply to C. comosum also.

The Lawn Book, by Robert W. Schery. 207 pp., half-tones, line drawings. The Macmillan Company, New York. 1961. $5.95.

A more complete manual on lawn-making and lawn-care would be hard to envision, for this book covers all aspects of the subject, considers the special problems of different geographical regions, and is as up-to-the-minute as it is possible for any publication to be concerning recent developments in the ever-advancing fields of weed-, insect-, and disease-control. Explanations, instructions, and advice are discerning and sensible, for Dr. Schery has had many years of broad practical experience in the subject both in the academic and commercial fields.

Aside from the usual information one might look for in such a work, there are such features as an interesting history of Kentucky bluegrass in America, drawings illustrating plants of the various lawn grasses as they appear when actually grown as such, along with their diagnostic leaf-ligules and inflorescences, drawings of 40 of the common lawn weeds for easy recognition (the Oxalis illustrated on p. 129, however, is O. corniculata and not O. stricta), and, in each chapter, a short section titled "More Fancy than Fact" refuting popular fallacies concerning the chapter topic.

This can be recommended as a valuable reference work for the shelf of every professional horticulturist and every homeowner interested in the appearance of his grounds, whether or not he is otherwise a "gardener."

W. J. D.

The Cultivated Species of Spathiphyllum[1]

George S. Bunting

Spathiphyllum is a genus of about 35 species of herbs, mostly native in tropical America. Nearly one-quarter of these species are in cultivation, being valued for their unique white inflorescences. Some species tolerate indoor conditions, and are attractive in combination planters for their foliage, though few blossoms are produced under conditions of low atmospheric humidity. All species are tender herbaceous plants, two to twelve dm. tall, forming dense clumps in age. The long-petioled leaves arise from usually horizontal rhizomes that are rooted on the lower side. The petioles are straight and stiff, commonly at least as long as the leaf-blade, vaginate or winged in the lower one-third or more, and geniculate at the apex. The blade may be lanceolate, oblong, elliptic, or ovate, often shiny above, and generally lax in the apical one-third or one-half and arched outward. Long, erect peduncles bear the spadices, each of which is subtended by a white or greenish spathe which may be spoon-like, decurrent on the peduncle, and held erect behind the spadix, or else flat, sessile, and reflexed. The spaidx itself may be smooth, or roughened by the conic styles of the pistils. The characteristics of the inflorescences serve to divide the genus into sections (see key).

The genus Spathiphyllum was monographed by Engler and Krause in 1908 (Das Pflanzenreich 4^{23B}: 118-134). The species treated there have since been variously interpreted by floristic workers and horticulturists, and considerable confusion has arisen in the nomenclature of both wild and cultivated species. Much of the confusion results from the paucity of quantitative specific characteristics, and the apparent reluctance of workers to make floral dissections. Many species of Spathiphyllum exhibit few vegetative differences other than in size. Observations show, moreover, that size of leaves, spathes, and spadices on a single plant is influenced by environmental conditions as well as chronological age, a situation that adds confusion in the identification of many aroids besides Spathiphyllum. Consequently, actual size can be an unreliable criterion for deter-

[1]Hybrid spathiphyllums will be discussed in a subsequent paper.

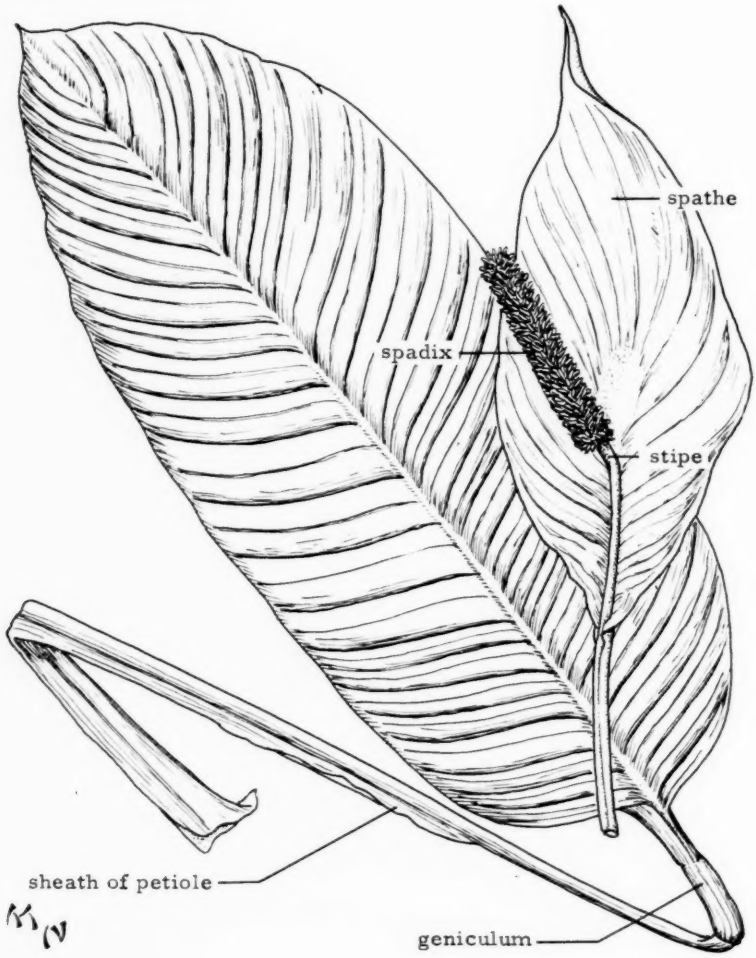

Fig. 38. Spathiphyllum cochlearispathum x 1/3.

mination of a species. Rather, it is the ratio of length to width, the proportional length of petiole or peduncle to leaf-blade, and floral features such as the number of ovules per locule that are constant characters useful in differentiating species of Spathiphyllum.

The name Spathiphyllum was published in 1832 (Schott in Meletemata Botanica 1: 22), although S. lanceaefolium was originally described by Jacquin (Collectaneae 4: 118. 1790) in the Linnean genus Dracontium. The name Spathiphyllum, meaning "spathe-leaf," is aptly applied to this genus.

Koch proposed the name Massowia (1852) for those species with a fused, cup-like perianth such as that found in S. cannaefolium and S. commutatum. Schott, however, discerned the natural relationship between these species and the others which he included in Spathiphyllum and reduced the name Massowia to designate only a section of the genus Spathiphyllum.

The most widely cultivated spathiphyllum is a supposed hybrid of unknown origin. It is distinctive in having rather narrow leaves on slender petioles, and white inflorescences with spoon-shaped spathes held erect behind the short spadices (which resemble an elongated medieval spiked mace). It is known in the horticultural trade as S. Clevelandii, as well as S. Wallisii, S. Kochii, and S. candidum. Discussion of this taxon will be presented in a subsequent paper on hybrid spathiphyllums.

Spathiphyllum cochlearispathum (Liebmann) Engler, the largest species of the genus, easily reaches 12 dm. in height. It has the northernmost distribution, occurring in southern gulf-coastal Mexico. Cultivated plants are quite uniform, distinguished by nearly oblong leaves strongly undulate along the margins, with widely spreading lateral veins. The petioles are broadly winged and sheathing, finely mottled with white, and usually crisped along the margins. The spadices are crowded with flowers whose styles are very long-exserted beyond the perianths. Common in cultivation, this species has been used as one of the parents of some hybrids.

Spathiphyllum blandum Schott was described in 1857 from a plant in cultivation in a European garden. Until the recent revisionary study of this genus[1], the nativity of S. blandum remained unknown. It appears to be identical with materials collected around the Gulf of Honduras in British Honduras, Guatemala, and Honduras. The elliptic leaf-blades narrow nearly equally toward either end, and the petioles are commonly winged right up to the geniculum. Spathes have a shape similar to that of the leaf-blades. Each locule of the ovary contains only 1-3 ovules.

[1]Bunting, G. S. "A Revision of Spathiphyllum (Araceae)." Memoirs of the New York Botanical Garden 10(3): 1-54. 1960.

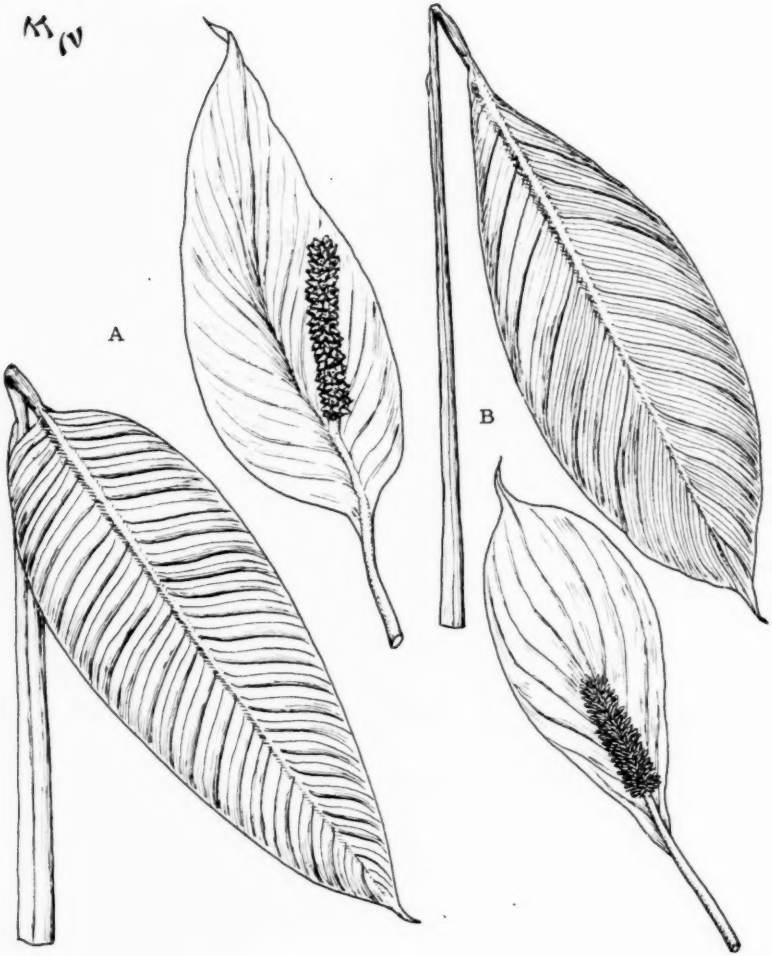

Fig. 39. A, Spathiphyllum phryniifolium x 1/3. B, Spathiphyllum Friedrichsthalii x 1/3.

Spathiphyllum phryniifolium Schott is in cultivation at some botanical gardens and horticultural establishments. This species has been included in floristic studies of countries from Mexico to Peru, but appears actually to be restricted in nature to Costa Rica and Panama. It has most often been confused with S. Friedrichsthalii Schott.[1] Though native in the same region, these two species are very different. In S. phryniifolium, the styles of the ovaries are conic but only shortly exserted beyond the perianth, and the locules of the ovary are bi- or uniovulate, whereas in S. Friedrichsthalii the styles are subcylindric and long-exserted and the locules of the ovary are multiovulate. The long-cuneate leaf-bases of the latter species quickly separate it from S. phyrniifolium, which has obtuse leaf-bases. I have never seen S. Friedrichsthalii in cultivation, though it is included in some trade lists.

Spathiphyllum Kochii Engler & Krause is similar to S. phryniifolium, and after further study may prove to be only a variety of the latter. The spathes are attenuate-acuminate and the spadices are borne on conspicuous, elongate stipes. Spathiphyllum Kochii is not known to be in cultivation, but is included here in an effort to eliminate some of the confusion that has resulted from the application of this name to the much cultivated S. 'Clevelandii' ("S. Clevelandii"). Detailed study of the type specimen of S. Kochii has proven that this Venezuelan species is very different from S. 'Clevelandii'.

Spathiphyllum cannaefolium (Dryander) Schott has been in cultivation at Kew since 1789. It is attractive both for its beauty and the fragrance of the inflorescences. It is the only really widespread American species, occurring throughout the northern part of South America east of the Andes, and is the only species of Spathiphyllum native on the island of Trinidad. Very closely related to it is S. commutatum Schott, a native of certain islands in central Indonesia and the Philippines. These two species are unquestionably discrete, but cultivated plants may be similar enough to be confused. Typically, the leaf-blades and spathes are proportionally narrower in the American species, while the spadix is a little stouter and the perianth-cup less angular in S. commutatum. Both are commonly cultivated.

Without question, the most handsome species of the group is S. floribundum (Linden & André) N. E. Brown[2] - a favorite in conservatories. It is somewhat delicate for culture under home conditions. The plant is only about 3 dm. tall. Its broad leaves are dark green above with paler midribs, and have a velvety luster. The small re-

[1]The photographs labeled "S. friedrichsthalii" in A. B. Graf's Exotica 2 (pp. 168, 169) apparently represent S. phryniifolium.

[2]The photograph in Graf's Exotica 2 (p. 170) labeled S. quindiuense appears to represent only a form of S. floribundum, or possibly a plant of hybrid origin.

flexed spathe is pure white above, subtending the green and white spadix. Spathiphyllum floribundum is native in the Magdalena Valley of Columbia.

A dainty but somewhat larger species than the last is S. Patinii (Hogg) N. E. Brown. It is known only in cultivation. Reportedly introduced from Columbia, it has not been matched by any material collected in the wild although it shows a close relationship to other Andean species. Vegetatively, S. Patinii suggests S. 'Clevelandii', with rather narrow leaves on slender petioles. The inflorescences, however, are almost identical with those of S. floribundum, and are borne well above the foliage on slender peduncles.

Key to the Sections and Species in Cultivation

1. Spathes broadly decurrent on the peduncles; styles exserted, attenuate-conic. [Sect. Spathiphyllum]
   2. Bases of leaf-blades decidedly acute.
      3. Blades narrowly lanceolate-oblong, 4-5 times longer than wide; petioles and peduncles very slender. . . . . (Hybrid) S. 'Clevelandii'
      3. Blades oblong-elliptic or elliptic, only 2-3 times longer than wide; petioles and peduncles not slender.
         4. Spathes generally elliptic, widest at middle, decidedly not long-cuneate at base, usually acuminate; 4-8 ovules per ovary. Br. Honduras, Guatemala, Honduras. . . . . S. blandum
   2. Bases of leaf-blades obtuse to subcordate.
      5. Blades oblong, genicula 4-5 cm. long; plants often 12 or more dm. or more tall. Mexico. . . . . S. cochlearispathum
      5. Blades elongate-elliptic to lanceolate, genicula not exceeding cm.; plants smaller.
         6. Spadices sessile or on stipes to ca. 15 cm. long. Costa Rica, Panama. . . . . S. phryniifolium
         6. Spadices on a conspicuously elongate stipe to 3 cm. long. Venezuela. . . . . S. Kochii

1. Spathes not decurrent, at least not broadly so, on the peduncle; styles apically truncate or subtruncate.
   7. Perianth-segments white in anthesis, united into a truncate cup surrounding the white ovary. [Sect. Massowia]
      8. Leaf-blades typically oblanceolate to narrow elliptic. N. South America. . . . . S. cannaefolium
      8. Leaf-blades typically broadly elliptic. Philippines, Indonesia. . . . . S. commutatum
   7. Perianth composed of separate segments apically green in anthesis; ovaries white. [Sect. Amomophyllum]

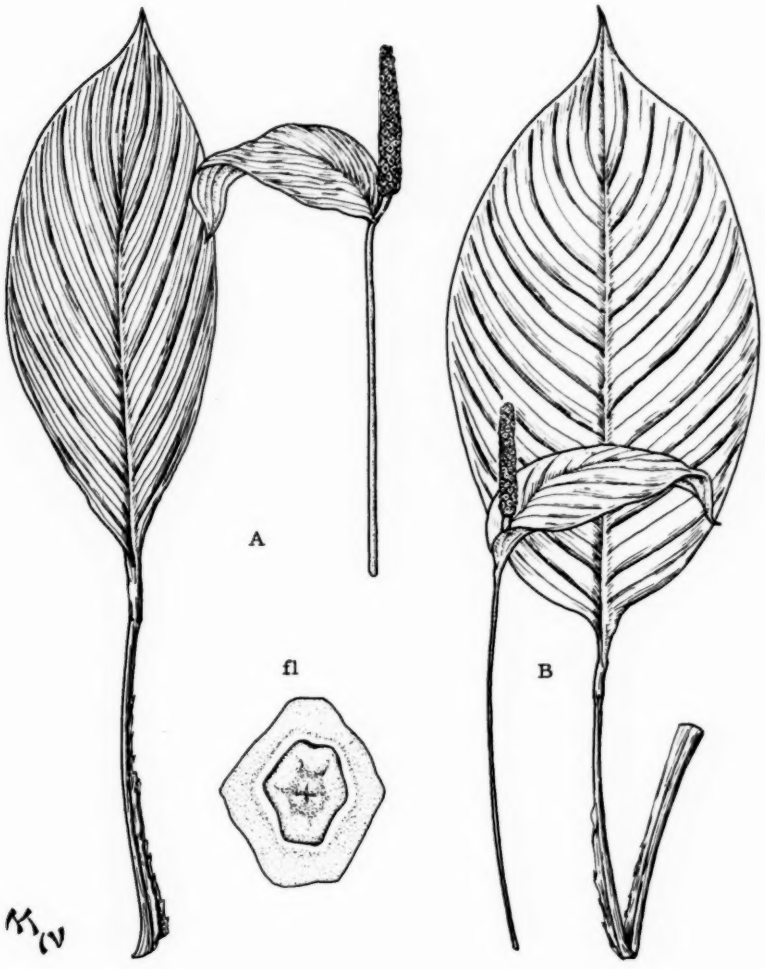

Fig. 40. A, Spathiphyllum cannaefolium x 1/3 (fl.: individual floret x 8). B, Spathiphyllum commutatum x 1/3.

Fig. 41. A, Spathiphyllum Patinii x 2/5. B, Spathiphyllum floribundum x 2/5.

9. Leaf-blades 2-3 times as long as wide, upper surface dark green with a velvety luster. Colombia. . . . . S. floribundum

9. Leaf-blades proportionally narrower, 4 or more times longer than wide, upper surface glossy without velvety luster. Known only in cultivation. . . . . S. Patinii

Appended here is a finding-list of scientific names to be found in recent horticultural and botanical works, catalogues, and seed lists, and which are applicable to the taxa discussed in this article. As usual, the names accepted in this article are underscored in the list, those rejected are not.

Spathiphyllum Schott
blandum Schott
candidum Bull :: the name is a synonym of S. Patinii, but material so listed may be S. 'Clevelandii'.
cannaefolium (Dryander) Schott
Clevelandii :: probably a hybrid of horticultural origin best treated as a cultivar - S. 'Clevelandii'.
cochlearispathum (Liebmann) Engler
commutatum Schott
cordatum :: Anthurium sp.
floribundum (Linden & André) N. E. Brown
Friedrichsthalii Schott
grandiflorum :: name of no botanical standing; material so listed may be a selection of S. cochlearispathum.
× hybridum N. E. Brown :: S. cannaefolium × S. Patinii; material so listed in the trade today is doubtfully the same.
Kochii Engler & Krause :: probably not in cultivation; material so listed is probably S. 'Clevelandii'.
Patinii (Hogg) N. E. Brown
phryniifolium Schott

Book Reviews

Trees, Shrubs and Woody Vines of the Southwest, by Robert A. Vines. xii + 1104 pp. and about 1200 black and white figures. University of Texas Press, Austin, Texas. 1960. $25.00

This book is essentially a keyless flora treating all native and naturalized woody plants of New Mexico, Texas, Oklahoma, Arkansas, and Louisana. The author describes 1231 species of plants; nearly all of these have been beautifully and accurately illustrated by Sarah Kahlden Arendale, showing either a flowering or a fruiting branch, or both. Detailed drawings of flowers are few. It has a very attractive format and is printed in double columns. Common and scientific names have been included for every taxon, each of which is included in its family; the families are arranged in the Engler system except for the Casuarinaceae which is out of sequence. No doubt Casuarina has become naturalized in this area, but it is doubtful whether Ginkgo has.

No family or generic descriptions are provided, but there are rather complete descriptions for the individual species, which are arranged in their proper genera and listed in their respective families. The author has faithfully included authorities for the specific epithets; however, certain inconsistencies in citation of ten authors' names have been noticed, e.g., Sereno Watson's name appears as Watson, S. Wats. and Wats. Each species description follows a definite pattern, with the headings: field identification, flowers, fruit, leaves, twigs, notes on the wood, notes on propagation, and, when pertinent, notes on medicinal uses. The meanings of generic names and specific epithets are given.

Inasmuch as the author seems to use the conservative approach to the delimitation of families, he retains Dasylirion and Yucca in the Liliaceae, and Agave in the Amaryllidaceae, instead of including the three genera in the Agavaceae. One might be surprised, however, to find that all the conifers are members of the Pinaceae. The incorrect spelling Pentstemon is substituted for Penstemon.

The book includes a glossary of terms, a bibliography of 424 entries, an index of common names, an index of scientific names, and a page of diagrams of leaf morphology, diagrams of flowers types, and a series of sketchy inflorescence diagrams. The diagram given for a "compound umbel" is actually a flat-topped dichasium, and the "head" looks like a blackberry fruit. It seems that it would have been better not to have included the spadix, since it could not possibly belong to a palm and no member of the Araceae is included. The umbel and the catkin illustrated are not typical.

After a few minutes' examination of this book, two questions came to mind; how does one use this book, and for whom was it written? Such a book one might refer to merely as a reference work providing illustrations or ready descriptions of plants, or one might try to use it to identify an unknown plant. In order to identify a plant by using this book, one must know either a common or a scientific name, or recognize the family to which the plant belongs and then turn the pages, either reading every description or looking at the pictures until the answer is found. In the genus Rubus, with 64 included species, this becomes a task. Since the

coverage of the native families is so complete, and the range of the work so vast, it is regrettable that keys, at least to the families and the large genera, were not included. However, there are a few keys scattered through it; that contributed by E. J. Palmer, on Crataegus, should be extremely valuable to anyone wishing to determine a species of this genus from this area.

A more complete listing of synonyms, a feature important to the professional taxonomist and perhaps useful also to the amateur, should have been included. This is particularly necessary because most of the few floras dealing with part of this area are old, and so there should be some means of correlating names in the present work with superseded names in such existing floras. Also, without keys, the usefulness of this book may depend on one's knowledge of a name, and the name one is familiar with may be an unincluded synonym.

This work, for those who can use it, does fill a definite botanical need, since the descriptions are accurate and much first hand knowledge has gone into its writing. The extensive field work has been done over 25 years, and Mr. Vines has traveled more than 250,000 miles to collect and study plants in the field. All the information supplied in this work results, however, in a book that is much too large to use in the field, for it is 11 3/8 inches high, 8 3/4 inches wide, 2 1/4 inches thick, and weighs 6 1/2 pounds.

J.I.

Flora of the Santa Cruz Mountains of California, A Manual of the Vascular Plants, by John Hunter Thomas. vi + 434 pp., 210 line drawings and 10 photographs. Stanford University Press, Stanford, California. 1961. $8.50.

This flora treats about 1800 taxa of native and naturalized vascular plants growing in an area of some 1,400 square miles, comprising the counties of San Francisco, San Mateo, Monterey, and the western part of Santa Clara County. Although this represents the first work for this specific area, the first manu[illegible] this century dealing in any great detail with this area was Jepson's A Flora of Western Middle California, published in 1901.

The introduction includes a detailed description of the physical geography of the Santa Cruz Mountains, notes on the climate, interesting discussions of the plant communities of the area and of the flora, and a history of botanical collecting for this region. There is also an informative account of the geology of the area, by Dr. Earl E. Brabb.

According to Dr. Thomas, this flora is intended for the amateur as well as for the professional botanist. Either might have some difficulty in correctly identifying a member of the traditionally hard-to-determine families such as the Gramineae, Cyperaceae, Cruciferae, Boraginaceae, and Compositae, especially in the larger genera, since no descriptions are given for any taxon, except what has been incorporated in the keys. One can key a plant to species and determine its correct Latin name, its habitat, and when it is expected to flower. For practically every species one or two or more common names have been given, often the same ones contrived and used in Abrams' Illustrated Flora of the Pacific States. Some 250 of the species are illustrated with line drawings originally used in the Abrams work. Author citations, of course, have been used, and many of these have been abbreviated, but none is explained. In some cases the author uses the same name

or abbreviation for two different people, e.g., Hitchc. for A. S. and C. L.; Grant for Adele and Verne; Mason for H. L. and C. T.; Howell for Thomas and John Thomas.

A glossary of technical terms is included and also separate indexes for common and scientific names. A most useful portion of the book is the index listing an extensive number of place-names, an invaluable aid to the person trying to locate a specific out-of-the-way locality in the Santa Cruz Mountains.

Although the print is small, the book in general is easily readable; however, a different type-face might better have been used for the common names, which are obscured because they tend to flow into the comments on the habitats.

This book will obviously be of most use to the person specifically interested in the local flora of the Santa Cruz Mountains. For those desiring descriptions of families, genera, and species, some other work will have to be consulted; $8.50 may therefore seem a bit expensive considering that a more complete flora of the entire state is available for less than $10.00.

J. I.

Southern California Gardens, An Illustrated History, by Victoria Padilla. xviii 359 pp. 150 photographs, 16 colored photographs, 2 maps. University of California Press, Berkeley and Los Angeles. 1961. $10.00.

This book is more than just a history of ornamental horticulture in southern California, for it accurately and interestingly portrays much of the history of the region from the early days of the padres to the present. The scope is, however, strictly southern California, to the point where only a casual reference is made to any locality north of Santa Barbara. Residents of southern California particularly should be interested in this volume dealing with their area, and any transplanted Native Son of the Southland will surely feel more than a twinge of nostalgia upon reading this delightful book, and viewing the familiar faces and landmarks shown in its numerous photographs. It is also recommended for all persons who, though they are not necessarily interested in gardening, do enjoy reading about people, places, and plants.

The author has organized and presented the material in a most appealing manner under the four sections, The Land, The Story, The Persons, and The Plants, giving the reader information on the horticultural history of southern California, short biographies of the men and women who shaped this horticulture, and notes on the plants which have been important in all kinds of local gardens. One chapter of particular interest to gardeners is "The Evolution of the Garden in Southern California."

For the most part, the nomenclature seems to be accurate; however, the reference to Heteromeles arbutifolia as "the native holly" is in error. In view of the fact that the term cultivar was used at least once in the book, it is surprising that such a recent work should, in all but a few cases, use double quotation marks around cultivar names, instead of single quotes as prescribed by the International Code of Nomenclature for Cultivated Plants. The proofreading is not of the highest caliber.

J. I.

ABBREVIATIONS USED IN BAILEYA

ann.	annual	dm.	decimeter	lf.	leaf
bien.	biennial	fl.	flower	lft.	leaflet
br.	branch	fls.	flowers	lvs.	leaves
brt.	branchlet	flt.	floret	mm.	millimeter
caps.	capsule	fr.	fruit	per.	perennial
cl.	clone	ft.	foot	segm.	segment
cm.	centimeter	hort.	horticultural	st.	stem
cv.	cultivar	in.	inch	sts.	stems
diam.	diameter	infl.	inflorescence	var.	variety

METRIC - ENGLISH EQUIVALENTS (approximate)

6 mm. - 1/4 in.	10 cm. - 4 in.	10 mm. - 1 cm.
12 mm. - 1/2 in.	1 dm. - 4 in.	10 cm. - 1 dm.
25 mm. - 1 in.	3 dm. - 1 ft.	10 dm. - 1 meter
2.5 cm. - 1 in.	10 dm. - 1 yd.	
5 cm. - 2 in.	1 m. - 39 in.	